THAT WHICH IS CLAIMED IS:

1. Method of processing an incident pulsed signal of the ultra wide band type received from a channel by an independent data device (DEV) of a wireless data communications system, said incident signal carrying information within a super-frame structure, each super-frame (SPF_i) including several frames (FR_i) respectively allocated to communications between specific pairs of independent data devices of the system and a head part or beacon (BC) containing at least a first training sequence (TS1), each frame including a preamble (PRB) containing at least a second training sequence (TS2), said method comprising

upon reception of each super-frame, a step of cell synchronization including a coarse synchronization (40) with another independent data device acting as a coordinator device (PNC) of the system, said coarse synchronization using said first training sequence, and

upon reception of each frame allocated to said independent data device within said super-frame, a step of channel estimation (43) using said second training sequence and based on at least one signal slice having ends (STI_i,L) temporally defined with respect to the result of the coarse synchronization for recovering all the channel energy, whereby said step of channel estimation performs also simultaneously a frame synchronization.

2. Method according to claim 1, characterized by the fact that said channel (CH) has a predetermined maximum length, by the fact that the beacon (BC) further contains a time of arrival

indication (TOA_j) for each frame (FR), by the fact that said coarse synchronization delivers a first delay information (Ts) corresponding to the delay between the received incident signal and the transmitted signal, and by the fact that said step of channel estimation (43) begins on a signal slice (SL) starting at an instant (St_i) equal to the time of arrival (TOA_i) of said frame (FR_i) increased with the difference (Ts-Te) between said first delay information (Ts) and a predetermined offset (Te), and having a size (L) equal to the maximum channel length (MLCH) increased with said predetermined offset (Te).

3. Method according to claim 2, characterized by the fact that said channel is a multipath channel, and said predetermined offset (Te) comprises a first offset taking into account the fact that said first delay information is associated with a path of said channel which can be different from the first path.

4. Method according to claim 3, characterized by the fact that said first offset is equal to about 10 ns.

5. Method according to any one of the preceding claims, characterized by the fact that said predetermined offset (Te) comprises a second offset taking into account the differences between the propagation delays between the coordinator and an independent data device and between a pair of independent data devices.

6. Method according to claim 5, characterized by the fact that said second offset depends on the maximum distance between two independent data devices of the system.

7. Method according to claim 6, characterized by the fact that said second offset is equal to about 30 ns.

8. Method according to claim 3 or 4 and any one of claims 5 to 7, characterized by the fact that said predetermined offset (Te) is the sum of said first and second offsets.

9. Method according to any one of the preceding claims, characterized by the fact that said first training sequence (TS1) is identical to said second training sequence (TS2).

10. Method according to any one of claims 1 to 9, characterized by the fact that said coarse synchronization and said step of channel estimation (43) comprise digital correlation.

11. Method according to claim 10, characterized by the fact that the second training sequence (TS2) is a dedicated pulse train having a pulse repetition period, by the fact that the correlation step performed during the channel estimation step comprises coherent integration of successive signal slices having the same size and mutually temporally shifted with said pulse repetition period.

12. Method according to any one of the preceding claims, characterized by the fact that said wireless data communication system is of the WPAN type, for example of the "piconet" type.

13. Independent data device of a wireless data communications system, comprising

- reception means (RCM) for receiving an incident pulsed signal of the ultra wide band type from a channel, said incident signal carrying information within a super-frame structure, each super-frame including several frames respectively allocated to communications between specific pairs of independent data devices of the system and a head part or beacon containing at least a first training sequence, each frame including a preamble containing at least a second training sequence, and

- processing means (PRM) including

• coarse synchronization means (CSM) for performing upon reception of each super-frame, a coarse synchronization with another independent data device acting as a coordinator device of the system, said coarse synchronization using said first training sequence, and

• channel estimation means (CHSM) for performing upon reception of each frame allocated to said independent data device within said super-frame, a step of channel estimation using said second training sequence and based on at least one signal slice having ends temporally defined with respect to the result of

the coarse synchronization for recovering all the channel energy,

whereby said channel estimation means are adapted to perform simultaneously said channel estimation and a frame synchronization.

14. Device according to claim 13, characterized by the fact that said channel has a predetermined maximum length, by the fact that the beacon (BC) further contains a time of arrival indication for each frame, by the fact that said coarse synchronization means delivers a first delay information corresponding to the delay between the received incident signal and the transmitted signal, and by the fact that channel estimation means (CHSM) are adapted to begin said step of channel estimation at a starting instant equal to the time of arrival of said frame increased with the difference between said first delay information and a predetermined offset, on a signal slice having a size equal to the maximum channel length increased with said predetermined offset.

15. Device according to claim 14, characterized by the fact that said channel (CH) is a multipath channel, and said predetermined offset (Te) comprises a first offset taking into account the fact that said first delay information is associated with a path of said channel which can be different from the first path.

16. Device according to claim 15, characterized by the fact that said first offset is equal to about 10 ns.

17. Device according to any one of claims 13 to 16, characterized by the fact that said predetermined offset (Te) comprises a second offset taking into account the differences between the propagation delays between the coordinator and an independent data device and between a pair of independent data devices.

18. Device according to claim 17, characterized by the fact that said second offset depends on the maximum distance between two independent data devices of the system.

19. Device according to claim 18, characterized by the fact that said second offset is equal to about 30 ns.

20. Device according to claim 15 or 16 and any one of claims 17 to 19, characterized by the fact that said predetermined offset (Te) is the sum of said first and second offsets.

21. Device according to any one of claims 13 to 20, characterized by the fact that said first training sequence is identical to said second training sequence.

22. Device according to any one of claims 13 to 21, characterized by the fact that said coarse synchronization means (CSM) and/or said channel estimation means (CHSM) comprise digital correlation means.

23. Device according to claim 22, characterized by the fact that the second training sequence is a dedicated pulse train having a pulse repetition period, by the fact that the correlation means comprises coherent integration means (CHIM) for performing during the channel estimation step, coherent integration of successive signal slices having the same size and mutually temporally shifted with said pulse repetition period.

24. Device according to any one of claim 13 to 23, characterized by the fact that said wireless data communication system is of the WPAN type, for example of the "piconet" type.